What is claimed is:

1. A three-dimensional photonic crystal, comprising:

a plurality of two-dimensional photonic crystal plates each provided with different types of two-dimensional photonic crystals; and

said pluralities of two-dimensional photonic crystal plates being positioned respectively to be laminated so as to obtain a periodic structure in response to wavelengths of light.

2. A three-dimensional photonic crystal, comprising:

a plurality of two-dimensional photonic crystal plates each provided with through holes and different types of two-dimensional photonic crystals;

a plurality of positioning members to be located in said through holes in said plurality of the two-dimensional photonic crystal plates; and

said positioning members being located in said through holes in the two-dimensional photonic crystal plates adjacent to each other among said pluralities of two-dimensional photonic crystal plates to be laminated in such that said pluralities of the two-dimensional photonic crystal plates obtain a periodic structure in response to wavelengths of light.

3. A three-dimensional photonic crystal, comprising:

a flat plate-like first two-dimensional photonic crystal plate provided with first through holes on a first frame as well as with first two-dimensional photonic crystals in a region inside said first frame;

a flat plate-like second two-dimensional photonic crystal plate provided with second through holes, being positioned with

respect to said first through holes, on a second frame as well as with second two-dimensional photonic crystals in a region inside said second frame;

positioning members located in such that said first through holes being communicated with said second through holes; and

said positioning members being located in such that said through holes in said first two-dimensional photonic crystal plate being communicated with said through holes in said second two-dimensional photonic crystal plate to be positioned, whereby said first two-dimensional photonic crystal plate is laminated with said second two-dimensional photonic crystal plate so as to obtain a periodic structure in response to wavelengths of light.

4. A three-dimensional photonic crystal as claimed in claim 3 wherein said first through holes and said second through holes are circular holes, respectively, a radius in each of said circular holes is substantially equal to thicknesses of said first two-dimensional photonic crystal plate and said second two-dimensional photonic crystal plate, and each of said positioning members is a sphere having a diameter corresponding to substantially doubled radius of said circular hole.

5. A process for the production of a three-dimensional photonic crystal, comprising the steps of:

allowing pluralities of two-dimensional photonic crystal plates each provided with different types of two-dimensional photonic crystals to adhere or to be held onto the extreme end of a probe in accordance with micromanipulation thereby moving them, respectively; and

positioning said pluralities of two-dimensional photonic

crystal plates with each other by means of moving them wherein these two-dimensional photonic crystal plates have been allowed to adhere or to be held onto the extreme end of said probe, so that said pluralities of two-dimensional photonic crystal plates are laminated so as to obtain a periodic structure in response to wavelengths of light.

6. A process for the production of a three-dimensional photonic crystal as claimed in claim 3 wherein said two-dimensional photonic crystal plates are allowed to adhere or to be held onto the extreme end of said probe by means of electrostatic adhesion wherein a predetermined voltage is applied to said probe.

7. A process for the production of a three-dimensional photonic crystal as claimed in any one of claims 5 and 6 wherein said two-dimensional photonic crystal plates are connected to outer hull regions with bridges held in midair; and

applying a load to said bridges with said probe to break down them thereby allowing said two-dimensional photonic crystal plates to adhere on the extreme end of said probe to move them as a result of such break-down of the bridges.

8. A process for the production of a three-dimensional photonic crystal as claimed in any one of claims 5 and 6 wherein said respective positioning of the pluralities of two-dimensional photonic crystal plates is conducted by moving each of said pluralities of two-dimensional photonic crystal plates with said probe, and each of said pluralities of two-dimensional photonic crystal plates is allowed to abut against a structural body having a predetermined shape.

9. A process for the production of a three-dimensional photonic crystal as claimed in claim 7 wherein said respective positioning of the pluralities of two-dimensional photonic crystal plates is conducted by moving each of said pluralities of two-dimensional photonic crystal plates with said probe, and each of said pluralities of two-dimensional photonic crystal plates is allowed to abut against a structural body having a predetermined shape.

10. A process for the production of a three-dimensional photonic crystal as claimed in any one of claims 5 and 6 wherein each of said pluralities of two-dimensional photonic crystal plates is a flat plate-like body wherein through holes have been defined on its frame part, besides a region inside said frame part is provided with different types of two-dimensional photonic crystals from one another; and

positioning members are located in said through holes in two-dimensional photonic crystal plates adjacent to each other among said pluralities of two-dimensional crystal plates to position them, whereby said pluralities of two-dimensional photonic crystal plates are laminated so as to obtain a periodic structure in response to wavelengths of light.

11. A process for the production of a three-dimensional photonic crystal as claimed in claim 7 wherein each of said pluralities of two-dimensional photonic crystal plates is a flat plate-like body wherein through holes have been defined on its frame part, besides a region inside said frame part is provided with different types of two-dimensional photonic crystals from one another; and

positioning members are located in said through holes in two-dimensional photonic crystal plates adjacent to each other among said pluralities of two-dimensional crystal plates to position them, whereby said pluralities of two-dimensional photonic crystal plates are laminated so as to obtain a periodic structure in response to wavelengths of light.

12. A process for the production of a three-dimensional photonic crystal as claimed in claim 10 wherein each of said through holes is a circular hole;

a radius of said circular hole is substantially equal to each thickness of said pluralities of two-dimensional photonic crystal plates; and

each of said positioning members is a sphere a diameter of which is equal to a substantially doubled radius of said circular hole.

13. A process for the production of a three-dimensional photonic crystal as claimed in claim 11 wherein each of said through holes is a circular hole;

a radius of said circular hole is substantially equal to each thickness of said pluralities of two-dimensional photonic crystal plates; and

each of said positioning members is a sphere a diameter of which is equal to a substantially doubled radius of said circular hole.

14. A process for the production of a three-dimensional photonic crystal as claimed in any one of claims 5 and 6 wherein a micro- and/or submicro-part for constituting an optical phase controlling region is inserted by means of said probe in the case

when said pluralities of two-dimensional photonic crystal plates are laminated so as to obtain a periodic structure in response to wavelengths of light.

15. A process for the production of a three-dimensional photonic crystal as claimed in claim 7 wherein a micro- and/or submicro-part for constituting an optical phase controlling region is inserted by means of said probe in the case when said pluralities of two-dimensional photonic crystal plates are laminated so as to obtain a periodic structure in response to wavelengths of light.

16. A process for the production of a three-dimensional photonic crystal as claimed in claim 8 wherein a micro- and/or submicro-part for constituting an optical phase controlling region is inserted by means of said probe in the case when said pluralities of two-dimensional photonic crystal plates are laminated so as to obtain a periodic structure in response to wavelengths of light.

17. A process for the production of a three-dimensional photonic crystal as claimed in claim 9 wherein a micro-and/or submicro-part for constituting an optical phase controlling region is inserted by means of said probe in the case when said pluralities of two-dimensional photonic crystal plates are laminated so as to obtain a periodic structure in response to wavelengths of light.

18. A process for the production of a three-dimensional photonic crystal as claimed in claim 10 wherein a micro- and/or submicro-part for constituting an optical phase controlling region is inserted by means of said probe in the case when said

pluralities of two-dimensional photonic crystal plates are laminated so as to obtain a periodic structure in response to wavelengths of light.

19. A process for the production of a three-dimensional photonic crystal as claimed in claim 11 wherein a micro- and/or submicro-part for constituting an optical phase controlling region is inserted by means of said probe in the case when said pluralities of two-dimensional photonic crystal plates are laminated so as to obtain a periodic structure in response to wavelengths of light.

20. A process for the production of a three-dimensional photonic crystal as claimed in claim 12 wherein a micro- and/or submicro-part for constituting an optical phase controlling region is inserted by means of said probe in the case when said pluralities of two-dimensional photonic crystal plates are laminated so as to obtain a periodic structure in response to wavelengths of light.

21. A process for the production of a three-dimensional photonic crystal as claimed in claim 13 wherein a micro- and/or submicro-part for constituting an optical phase controlling region is inserted by means of said probe in the case when said pluralities of two-dimensional photonic crystal plates are laminated so as to obtain a periodic structure in response to wavelengths of light.

22. A probe, comprising:

an inner core made of a metal;

an insulating layer formed around said inner core;

an outer metallic film formed on the outer periphery of said

insulating layer except for the extreme end portion thereof;

the extreme end portion of said insulating layer having a shape of a flat surface; and

an electric field being generated in the vicinity of marginal portion of said extreme end portion by applying a voltage across said inner core and said outer metallic film so that a material is electrostatically adhered.

23. A probe, comprising:

an insulator needle the extreme end portion of which is a flattened surface;

a first electrode and a second electrode disposed on said insulator needle so as to constitute a comb electrode in said flattened surface of said extreme end portion in said insulator needle;

an insulating film covering said insulator needle provided with said first electrode and said second electrode;

a metallic shield formed on the outer periphery of said insulating film except for a side of said extreme end portion, which is said flattened surface of said insulator needle; and

an electric field being generated over said flattened surface in said extreme end portion of said insulator needle by applying different voltages with respect to said metallic shield from one another to said first electrode and said second electrode, respectively, so that a material is electrostatically sticked.